

MEMORANDUM

INTERMOUNTAIN POWER SERVICE CORPORATION

TO: George W. Cross

FROM: Dennis K. Killian

DATE: February 13, 2003

SUBJECT: Boiler Testing Equipment Rental, PR# 185848

Please approve the attached Purchase Requisition for the rental of test equipment to measure combustion gas properties (NO_x, CO, O₂ & CO₂) to establish boiler baseline pre-outage conditions and conduct post-outage tuning of the overfire air system plus determine final acceptance of modified boiler components (superheat platen extension and overfire air). Rental includes 11 analyzers, 1 data logger and controller, plus a technician for initial setup and training. Total estimated cost is \$65,000.

We have recently been directed by the Utah State of Air Quality, as part of the Notice Of Intent (NOI) approval process, to document baseline combustion conditions on IGS Unit 1 prior to the Spring Outage 2003. This has moved up our original timeline two months for conducting post-Outage testing. IPSC Engineering Group will be conducting the performance testing. However, we do not have NO_x, CO, O₂ & CO₂ gas analyzers, plus data logger and controller for electronic data acquisition. We do have the boiler outlet test probes (16) and thermocouples (64), bubblers, chillers, knockout bottles, desiccant filters, vacuum pumps and supporting hardware.

Post-Outage testing on the boiler will consist of several weeks of tuning and diagnostics for setup of the burners and overfire air system, prior to the final acceptance testing. The primary objective of the overall testing is to see if the manufacturer has met contractual guarantees on the superheat platen extension and overfire air system. Secondary test objectives are to determine where best the overfire air system works and to establish operator guidance for use of this system.

Tuning and diagnostics will be accomplished using the combustion gas analyzers, by conducting multipoint gas sampling at the boiler outlet duct to establish NO_x, CO, O₂, CO₂ & temperature conditions at both 875 MW_{gross} and 950 MW_{gross} load levels. There will be a 64 point grid (32 points of both east and west sides) to determine the degree of gas stratification. Knowing the amount and location of stratification (high and low zones),

it can be used as a diagnostics tool to tune burners or overfire dampers to minimize this effect. Typically, extremely high or low values for CO and NO_x reflect bad actors (incomplete combustion) which should be tunable. The CO₂ and O₂ analyzers will be used to determine air flow balancing, plus will be used for boiler efficiency (gas loss method) calculations. Additionally, the test O₂ analyzers will be used to reconcile accuracies with the station O₂ analyzers (both test grids are at the same location).

Obviously during the performance testing, we will also determine the following conditions:

- Main Steam and Hot Reheat temperatures
- Main Steam and Hot Reheat attempering spray flows

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